

# MARYLAND COASTAL BAYS WATER-USE ASSESSMENT: UNDERSTANDING USERS' BEHAVIORS, ATTITUDES AND PERCEPTIONS

## SUMMARY OF FINDINGS

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### INTRODUCTION & METHODS

Maryland's coastal bays lie between the barrier islands of Ocean City and Assateague Island and the mainland of Worcester County, Maryland. Stretching from the Delaware to Virginia state lines, the bays include Assawoman, Isle of Wight, Sinepuxent and Chincoteague Bays (Figure 1). The bays and their watershed encompass 175 square miles and support numerous rare and threatened plant and animal species, forests and wetlands vital to migratory shorebirds and waterfowl, and many important commercial and recreational finfish and shellfish species.

Recreational attractions like swimming, boating, fishing and nature activities, such as birding, are all dependent upon a healthy ecosystem. As recreational use of the coastal bays grows, balancing resource protection with public use will become increasingly complex. Recreational boating is a very popular activity, particularly during the summer months. As the number of boaters has increased, so too has the incidence of user conflicts, crowding and safety concerns.

The recently completed Maryland Coastal Bays Comprehensive Conservation and Management Plan (CCMP) recognized the importance of recreational boating and includes numerous action items to address boating-related problems. To gain a better understanding of recreational users using the bays, the Maryland Department of Natural Resources (MDDNR) Fisheries Service contracted with the University of Delaware Sea Grant Marine Advisory Service to conduct a study of water users on Maryland's coastal bays.

The first of two major components of the study included a field survey in which 201 boaters were interviewed at various access points around the coastal bays during the summer of 2000. The second major component was a mail survey of 1,500 Maryland boaters randomly selected from the state's boat registration files. Samples were drawn from Worcester and Wicomico Counties, with additional samples selected from Ocean City and the Berlin/Ocean Pines communities. The survey subjects were further classified into three groups based on boat size: under 16 feet, 16 to 25 feet and over 25 feet. A 61% overall response rate was achieved.

Similar questions were asked of boaters in both components of the study so that the responses from each group could be merged and analyzed collectively. It is important to note that all boaters using the bays are not a homogeneous group. To detect differences between boaters, two distinct subsets were defined — **in-water boaters** and **trailerable boaters**.

### STUDY RESULTS

#### Profile of Coastal Bays Boaters

Forty-one percent of all the respondents noted that they kept their boats in the water, and 59% indicated that they trailered their boats. Those individuals that kept their boats in the water were identified as **in-water boaters**. The majority of them lived in the Maryland communities of Ocean City and Ocean Pines. The **trailerable boaters** that launched their boats at boat ramps around the bays lived both out-of-state and in various cities and towns in Maryland, with many residing in Worcester and Wicomico counties.

The average age of boaters in the study was 54 years. In-water boaters tended to be older than trailerable boaters and were also more educated. Those that trailered their boats were more likely to be employed full-time (63% versus 47%), whereas in-water boaters reported a higher incidence of retirees (46% versus 29%). The in-water boating segment also had a greater tendency to have memberships in boating or sportfishing organizations (27% versus 20%). Respondents across both groups owned their current boat an average of 7 years.

Boaters overall were fairly experienced — 44% had greater than 20 years of boating experience. Nearly two-thirds of all boaters considered themselves advanced (48%) or expert (17%) in their boating skills, and only 5% considered themselves novices.

More than three-quarters (77%) of all respondents familiarized themselves with new Coast Guard regulations each

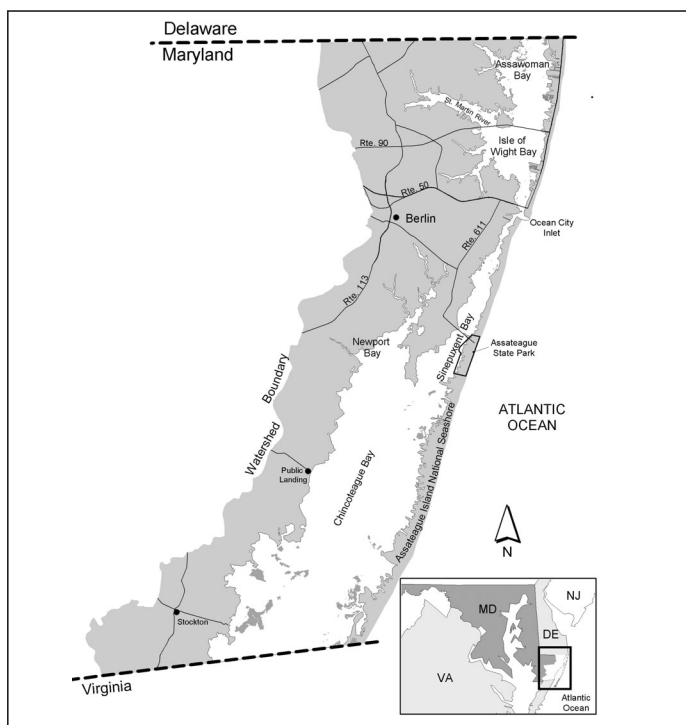


Figure 1. Maryland Coastal Bays Watershed

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year. Thirty-one percent received an annual Coast Guard Auxiliary courtesy safety inspection, and 59% had taken a boater safety training course.

The average size boat in the study was slightly greater than 18 feet. As expected, boats kept in the water at marinas or private docks during the boating season were larger, on average, than trailered boats (20'4" versus 16'10"). Sixty-three percent of the boats in the study were categorized as powerboats. Jonboats made up 14% of the total, and pontoon boats represented 10%. Personal watercraft, or jetskis, represented 6% overall, and sailboats made up 3% of the total.

## Boaters' Activity Patterns

Overall, boaters averaged 35 days boating on Maryland's coastal bays in 2000. In-water boaters spent more than twice as many days on the bays than trailerable boaters (50 days versus 23 days).

Boaters selected the bays as a boating destination primarily because the bays were close to where they lived or where they were staying while visiting the area (88%). Good fishing was suggested as a reason by one-half of all respondents (50%). In-water boaters were more likely than trailerable boaters (42% versus 34%) to suggest that the scenic qualities of the bays were important to them. Trailerable boaters were more likely than in-water boaters (18% versus 12%) to state that the lack of other boating traffic was a reason they selected the bays (Table 1).

Coastal bays boaters primarily engaged in cruising and fishing, although they also participated in crabbing, clamming, waterskiing/tubing and swimming. Field-surveyed respondents answered specific questions relating to their fishing experiences. These boaters spent an average of 13 days fishing in the bays during the previous twelve months. Although they were generally pleased with their fishing experiences, more than one-half (53%) indicated that they would visit Maryland's coastal bays even if they did not plan to fish. About one-half (51%) indicated that they were not in favor of a coastal bays fishing license, even if the money were used to improve fishing in the bays. Forty-five percent noted that they would support such a license if the funds were used in the bays. When asked to rate a series of statements about their fishing trip, boaters' highest response was that they

would fish Maryland's coastal bays again (4.7 rating on a 5-point scale). Many wished they had caught more fish (4.3 rating), but others felt that they would have been happy even if they had not caught any fish (3.6 rating).

Crabbing was also an important activity engaged in by 44% of all respondents. In-water boaters (56%) were significantly more inclined to participate than trailerable boaters (36%), spending almost three times as many days, on average, crabbing during the year than trailerable boaters (26 days versus 9 days). This may be due to the fact that many can tie crab pots to their docks or bulkheads. Even though trailerable boaters spent fewer days crabbing, they reported a higher per-trip catch, (23 crabs per trip versus 14 crabs per trip). More than two-thirds overall perceived that blue crab stocks in Maryland's coastal bays were decreasing.

## Understanding Boating Activity Patterns Using GIS Mapping

The use of Geographic Information System (GIS) tools to depict boating activity is relatively new. However, geographers and others have used GIS-based maps to identify land-based features for some time. Natural resource agencies are also mapping various features using GIS.

In an effort to gain a broad perspective of boating activity on the bays during peak boating times, MDDNR staff conducted aerial flights over the bays on seven separate weekend days during the summer of 2000, counting an average of 283 vessels between 10 a.m. and 2 p.m. each day. This information was recorded and mapped to visually depict the spatial nature of boating activity on the bays.

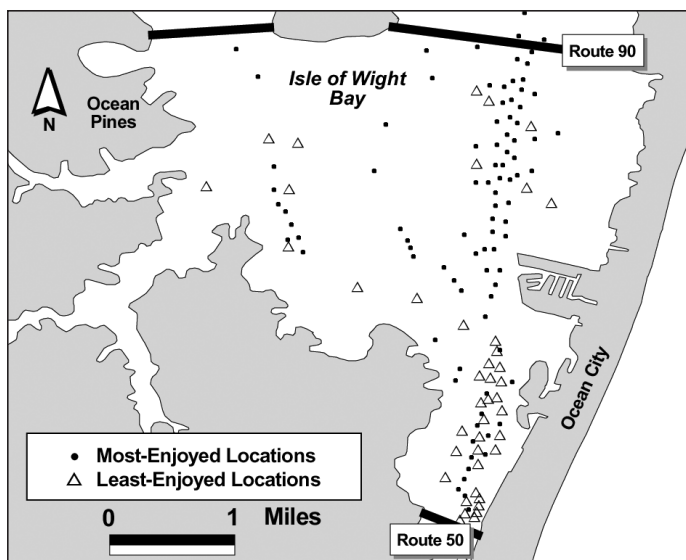
Field-interviewed boaters were asked to provide a spatial reference of their boating activity by indicating on a map their routes and activities during their day's outing. This information provided valuable insight into activity patterns and locations of intense boating traffic and crowding. This information was also compiled and represented as "activity points" in GIS map format. These points were fairly dispersed throughout the bays, with major concentrations of fishing activity occurring in the Ocean City Inlet area and throughout Isle of Wight and Sinepuxent Bays. Waterskiing occurred mostly in the open expanses of Isle of Wight Bay, with limited clamming and crabbing activity depicted in Isle of Wight and Sinepuxent Bays.

Field survey respondents also marked areas on the maps that they "most enjoyed" and "least enjoyed" and mentioned specific reasons for their likes and dislikes. In general, boaters throughout the bays were very complimentary about areas of good fishing, less crowding, nice scenery and calm water. They least enjoyed areas with too many other boats, too many jetskis, shallow water and rough water.

Naturally, boaters' enjoyment preferences were subjective and varied by their geographic location on the bays. For example, Figure 2 shows a map of most- and least-enjoyed areas in Isle of Wight Bay. The majority of the most-enjoyed locations represent good fishing spots. Lack of crowds was also cited favorably, mainly in the upper reaches of the bay. By contrast, crowding and too many other boats were reasons given for the majority of the

REASON	ALL (n = 715)	IN-WATER (n = 375)	TRAILER (n = 332)
Close to Home/ Other Lodgings	88	95	81
Good Fishing	50	44	56
Scenic Qualities of Bays	39	42	34
Peaceful Location	38	40	37
To Observe Wildlife	26	26	27
Good Water Quality	25	25	25
Adequate Channel Markers	22	24	19
Adequate Water Depth	18	17	19
Not a Lot of Other Boating Traffic	15	12	18

**Table 1.** Reasons for Boating on Maryland Coastal Bays (Percent responding YES)



**Figure 2.** Most-Enjoyed and Least-Enjoyed Locations in Isle of Wight Bay (Map symbols are not to scale, but represent approximately all the locations identified by field survey respondents during the entire summer of 2000.)

least-enjoyed locations in the lower areas of the bay, especially near the Route 50 Bridge.

### Perceptions of Boating Experiences

Boaters' perceptions of their on-water experiences are also vital in assessing their satisfaction levels. When asked how they rated their overall experiences on the bays, 16% rated them as either "excellent" or "perfect." The majority of responding boaters indicated that they thought boating was "good" (32%) or "very good" (36%). Initially, these results indicated a fairly high level of boating satisfaction among the respondents. However, when asked to rate the quality of their boating experiences over the last five years, the majority (57%) sensed that their experiences had remained the same. Almost one-third of the respondents (29%) thought they had decreased, while only 14% felt that they had increased. Boaters commented that crowding, greater numbers of PWCs and shoaling conditions in the bays were the main reasons for decreases in the quality of their on-water experiences.

Boaters rated a series of statements about boating conditions on the bays. The highest-rated boating concern was that other boaters operated their vessels in an unsafe manner (4.4 rating on a 5-point scale), and 86% of respondents mentioned that this was a "very" or "extremely" important concern. General safety-related comments focused on boaters being unfamiliar with the "rules of the road," traveling too fast and operating unsafely or recklessly in crowded areas. Another highly-rated concern was that many boaters were operating vessels under the influence of alcohol or drugs (4.2 rating).

Respondents also voiced serious concerns about the overcrowding of the bays' navigable waterways (4.1 rating), with three-quarters (74%) mentioning this as a "very" or "extremely" important concern. As expected, the areas cited as being most crowded were the navigation channels, such as the Ocean City Inlet/Route 50 Bridge area, the Thorofare

and other channels in lower Isle of Wight Bay and the narrower areas of Sinepuxent Bay.

In addition, boaters attached relatively high importance to water quality, (4.0 rating), suggesting that they are placing more importance on a clean environment as a factor in their overall boating satisfaction (Table 2).

One-half of all respondents felt that user conflicts existed in the bays. Local in-water boaters showed more sensitivity to conflicts than their trailerable counterparts (57% versus 41%). The most comments from boaters focusing on user conflicts were directed at PWC operators, speeding boats and commercial clam dredgers.

### Environmental Concerns

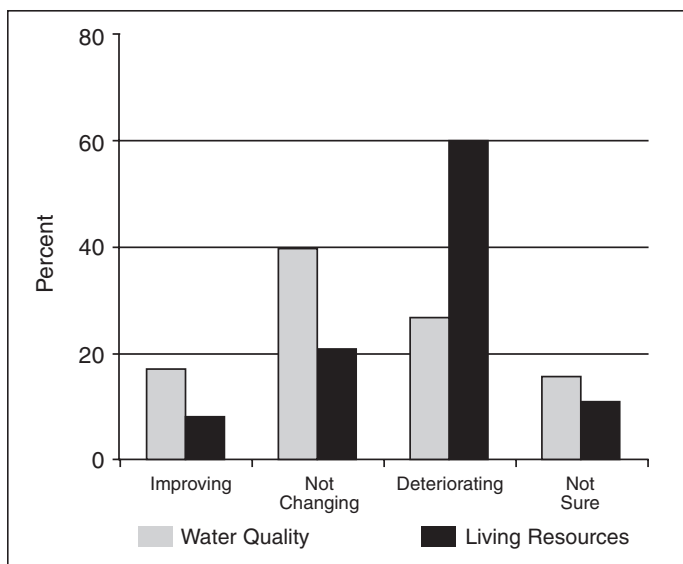
When asked about environmental issues facing the bays, boaters provided some interesting responses about water quality and living resources. The largest segment (40%) perceived that water quality in the bays had not changed very much over the last five years. Slightly more than one-quarter (28%) thought it was deteriorating. A majority (61%) of all boaters felt living resources in the bays (e.g. crabs, clams and fish) had deteriorated over the last five years. Only 8% felt that the living resources had improved during that time period (Figure 3).

Boaters were also asked to provide their perceptions of which user groups caused specific environmental impacts in the bays — recreational users or commercial fishing boats. It is interesting that recreational boaters thought that they were more likely to create excess water turbulence and shoreline erosion, cause prop scouring of bottom sediment, disturb nesting shorebirds and dump waste from marine sanitation devices (MSDs) in the bays more often than commercial vessels. They perceived that commercial boats were more responsible for discharging oil/gas into the water and disturbing bay sea grasses.

BOATING CONCERNS	ALL BOATERS (n = 684)	
	AVERAGE RATING	PERCENT "VERY" OR "EXTREMELY IMPORTANT"
Boaters Operating in an Unsafe Manner	4.4	86
Boaters Operating Under the Influence	4.2	75
Overcrowding of Navigable Waters	4.1	74
Poor Water Quality Affecting Boating	4.0	71
Lack of Adequate Navigation Channels	3.6	56
Lack of Proper Navigational Aids	3.5	54
Boats Drifting/Anchored in Channels	3.4	48
Lack of Marine Enforcement	3.3	42
Overcrowding at Popular Boat Ramps	3.1	40

**Table 2.** Concerns of Boaters (Average ratings based on a 5-point scale: 1 = Not at all Important; 5 = Extremely Important)





**Figure 3.** Perceptions of Water Quality and Living Resources

### Management Considerations

Boaters also rated a number of potential management options. For the most part, they were reluctant to support more regulations, and they did not solidly support many of the options that were presented. However, the greatest number of respondents were in agreement that jetskis using the bays should be limited (3.9 rating on a 5-point scale). There was also moderate support for adding regulations if they improved water quality in the bays (3.5 rating), restricting boat use in shallow waters (3.3 rating) and imposing stricter limits on harvesting of the bays' living resources (3.3 rating). The least favored option overall was limiting the number of boats using the bays (2.2 rating) (Table 3).

Mail-surveyed boaters were asked how they would react if the bays became more crowded. Almost two-thirds (63%) indicated that they would spend less time boating on the bays. One-half (50%) said that they would boat at different times than usual, and 25% said that they would participate less frequently in certain activities.

MANAGEMENT OPTIONS	ALL BOATERS (n = 677)	
	AVERAGE RATING	PERCENT "FAVOR" OR "STRONGLY FAVOR"
Limit Number of Jetskis Using Bays	3.9	66
Add Regulations to Improve Bays Water Quality	3.5	55
Restrict Boat Use in Shallow Waters	3.3	50
Stricter Limits on Harvesting of Fish, Clams and Crabs	3.3	46
Zone Waters to Provide for Certain Uses in Certain Areas	3.0	42
Develop Additional Boat Access to Bays	2.9	33
Require Baywide SWFL, with Money Going to Improve Bays Fishing	2.5	29
Require Seasonal Boating Permit to Bays, with Money Used for Bay Improvements	2.4	26
Limit Number of Boats Using Bays	2.2	14

**Table 3.** Potential Management Options for Maryland Coastal Bays (Average ratings based on a 5-point scale: 1 = Strongly Oppose; 5 = Strongly Favor)

### CONCLUSIONS & RECOMMENDATIONS

This study provided a comprehensive analysis of Maryland Coastal Bays boaters. Their perceptions, attitudes and opinions provide a helpful view of conditions in a multi-use environment, and this information establishes an important baseline by which to measure future changes. MDDNR officials and Maryland Coastal Bays Program staff should continue to work with all interest groups to insure that the bays remain a safe, enjoyable resource for current and future generations.

### MANAGEMENT, PLANNING & POLICY RECOMMENDATIONS

- ◆ Closely monitor "hot spots" of crowding, conflicts and environmental impacts.
- ◆ Strengthen educational efforts and enforcement regarding boating safety and courtesy, as well as resource conservation, especially focusing on non-resident visitors.
- ◆ Monitor PWC activity and develop systems to alleviate conflicts between PWC users and other boaters.
- ◆ Develop a comprehensive dredging plan for the bays and provide adequate markings of shallow areas.
- ◆ Develop a system to monitor boaters' satisfaction levels, track user conflicts and anticipate future conflicts.
- ◆ Address the issue of overcrowded boat ramps and plan for establishing more access points to the bays.
- ◆ Consider water zoning as a tool to minimize conflicts between certain bay uses.
- ◆ Develop a computerized system to track the growth trends of boat slips, docks and other boat storage and access facilities around the bays.



This summary has been excerpted from *Maryland Coastal Bays Water-Use Assessment: Understanding Users' Behaviors, Attitudes and Perceptions*. For more information on the study findings, contact: Maryland Department of Natural Resources, Fisheries Service, Tawes Building, B-2, Taylor Avenue, Annapolis, MD 21401, 410-260-8281 or University of Delaware, Sea Grant Marine Advisory Service, 700 Pilottown Road, Lewes, DE 19958, 302-645-4346. Delaware Sea Grant Reference Number DEL-SG-09-02.

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